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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/476,468	12/30/1999	SAMUEL L. THOMASSON	10205.020	7888

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EXAMINER

HAROLD, JEFFEREY F

ART UNIT	PAPER NUMBER
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2644

DATE MAILED: 10/23/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/476,468

Applicant(s)

THOMASSON, SAMUEL L.

Examiner

Jefferey F. Harold

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 July 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 5-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 5-7 is/are allowed.
- 6) ☒ Claim(s) 1,8 and 11 is/are rejected.
- 7) ☒ Claim(s) 2 9 10 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. **Claims 1 and 8** are rejected under 35 U.S.C. 102(b) as being anticipated by Genter (United States Patent 5,561,668).

Regarding **claim 1**, Genter discloses an echo canceller with sub-band attenuation. In addition, Genter discloses an echo canceller, which reads on claimed "audio processing circuit", including a plurality of band-pass filters (26a-p) and summation amplifier (44), which reads on claimed "summation circuit", for combining the outputs of the band pass filters, as disclosed at column 3, lines 45-64; column 4, lines 52-64 and exhibited in figure 1, comprising:

non-linear processor (36a-p), which reads on claimed "multiplex circuit", between the band-pass filters (26a-p) and the summation amplifier (44), wherein the non-linear processor (36a-p) selectively attenuates (i.e., blocks) the output of the band-pass filters (26a-p) thereby selecting which band(s) of the bands (26a-p) that is passed to the summation amplifier (44), as disclosed at column 4, line 65 through column 5, line 15 and exhibited in figure 2;

an attenuation factor controller (60) coupled to the non-linear processor (36a-p) for coupling subset of the band-pass filters (26a-p), by attenuation, to the summation amplifier (44), as disclosed at column 5, lines 16-21 and exhibited in figure 3.

Regarding **claim 8**, it is interpreted and thus rejected for the reasons set forth above in the rejection of claim 1. In addition, the non-linear processors in each path read on the first and second multiplex circuit and the attenuation factor controller reads on the claimed "controller"

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 11** is rejected under 35 U.S.C. 103(a) as being unpatentable over Genter in view of McCaslin et al. (United States Patent 5,668,794), hereinafter referenced as McCaslin.

Regarding **claim 11**, Genter discloses an echo canceller with sub-band attenuation as described above in the rejection of claim 1. In addition Genter discloses non-linear processor (36a-p), which selectively attenuates (i.e., blocks) the output of the band-pass filters (26a-p), however, Genter fails to disclose providing an indication of the duration of each filtered output signal and attenuating a filtered output signal if the duration of the filter output signal exceeds a predetermined period. However, the

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examiner maintains that it was well known in the art to provide an indication of the duration of each filtered output signal and attenuating a filtered output signal if the duration of the filter output signal exceeds a predetermined period, as taught by McCaslin.

In a similar field of endeavor McCaslin discloses a variable gain echo suppressor. In addition, regarding attenuating a filtered output signal if the duration of the filter output signal exceeds a predetermined period, McCaslin discloses that an echo canceller typically provides echo cancellation for approximately 50ms. However, echo may remain for a longer duration of time (i.e., longer than 50ms). In such case the echo suppressor will provide further attenuation of the electrical signal, as disclosed at column 25, lines 18-38.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Genter by specifically providing attenuating a filtered output signal if the duration of the filter output signal exceeds a predetermined period, as taught by McCaslin, for the purpose of further reducing the amount of echo being provided to the far end.

Regarding providing an indication of the duration of each filtered output signal, McCaslin discloses the system as described above. Further when the echo exceeds the 50ms duration the echo suppressor provides additional signal attenuation.

Therefore it is inherent that by providing further attenuation is also an indication of the duration of the signal.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Genter by specifically providing an indication of the duration of each filtered output signal, as taught by McCaslin, for the purpose of placing the variable echo suppressor in and out of service.

Allowable Subject Matter

3. ***Claims 5-7*** are allowed.

4. The following is an examiner's statement of reasons for allowance:

Regarding **claim 5**, Genter discloses an echo canceller with sub-band attenuation for full duplex operation comprising a send and receive channel (i.e., two channels). Wherein the incoming signal from the far end is applied to the receive channel (i.e., the first channel) and the outgoing signal from the near end is applied to send channel (i.e. second channel). Further each channel includes a plurality of band pass filters. The incoming signal is applied to the first channel, processed through the band pass filters and allocated to the first channel output (i.e., receive out (RO)). In addition, the output signal is applied to the second channel, processed through the band pass filters and allocated to the second channel output (i.e., send out (SO)). However, the prior art of record failed to specifically disclose or fairly suggest providing an indication of the magnitude of the signal in each band in each channel, nor as part of the allocation step, upon determining which channel has the signal with highest magnitude, coupling that signal to the respective channel output for that band and blocking the signal in the corresponding band in the other channel from the other

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channel output, proceeding to the other channel and repeating the process for each next largest signal from the remaining bands.

Regarding **claim 6**, Genter discloses an echo canceller with sub-band attenuation for full duplex operation comprising a send and receive channel (i.e., two channels). Wherein the incoming signal from the far end is applied to the receive channel (i.e., the first channel) and the outgoing signal from the near end is applied to send channel (i.e. second channel). Further each channel includes a plurality of band pass filters. The incoming signal is applied to the first channel, processed through the band pass filters and allocated to the first channel output (i.e., receive out (RO)). In addition, the output signal is applied to the second channel, processed through the band pass filters and allocated to the second channel output (i.e., send out (SO)). However, the prior art of record failed to specifically disclose or fairly suggest providing an indication of the magnitude of the signal in each band in each channel, nor as part of the allocation step, upon determining which channel has the signal with highest magnitude, coupling the signal from that band and from alternate bands in the same channel to the channel output for those bands, blocking the corresponding bands in the other channel from the channel output for those bands, and coupling the remaining bands in the other channel to the channel output for those bands.

Regarding **claim 7**, Genter discloses an echo canceller with sub-band attenuation for full duplex operation comprising a send and receive channel (i.e., two channels). Wherein the incoming signal from the far end is applied to the receive channel (i.e., the first channel) and the outgoing signal from the near end is applied to

send channel (i.e. second channel). Further each channel includes a plurality of band pass filters. The incoming signal is applied to the first channel, processed through the band pass filters and allocated to the first channel output (i.e., receive out (RO)). In addition, the output signal is applied to the second channel, processed through the band pass filters and allocated to the second channel output (i.e., send out (SO)). However, the prior art of record failed to specifically disclose or fairly suggest providing an indication of the magnitude of the signal in each band in each channel, nor as part of the allocation step, allocating the signal in the first channel to the first channel output and the signals in the second channel to the second channel output by, determining the duration of a signal exceeding a threshold, and not allocating the signal if the duration of the signal exceeds a predetermined period.

5. **Claims 2, 9-10 and 12** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding **claim 2**, the prior art of record failed to specifically disclose or fairly suggest band-pass filters that have a pass band of one half octave or less.

Regarding **claim 9**, the prior art of record failed to specifically disclose or fairly suggest a telephone wherein a controller includes a amplitude detector for each band and controls the first and second multiplex circuit in accordance with the amplitudes of the signals in each band.

Regarding **claim 12**, the prior art of record failed to specifically disclose or fairly suggest wherein the providing step includes providing an indication of the magnitude of

each filtered output signal and attenuating the output signal if the magnitude of the filtered output signal exceeds a predetermined amount and the duration of the filtered output signal exceeds a predetermined period.

Response to Arguments

6. Applicant's arguments with respect to claim 8, has been considered but are moot in view of the new ground(s) of rejection. The rejection of claim 8 was inadvertently omitted and is provided above.

7. Applicant's arguments filed July 12, 2002, have been fully considered but they are not persuasive.

Regarding applicant's argument regarding the rejection base of the multiplex circuit with the non-linear processor of Genter, the examiner respectfully disagrees. First the examiner thanks applicant for providing for the record excerpt from Digital Signal Processing in Telecommunications. However, examiner rejection is based on the function that the non-linear processor of Genter performs not on the text book definition of a non-linear processor. In applicant's summary of invention, the multiplex circuit selects subsets of the signals in each channel in accordance with the magnitudes of the signals in each band. The non-linear processor of Genter, as described above, performs that function, therefore it "reads on" the claimed multiplex circuit.

Regarding applicant's argument concern McCaslin, the examiner respectfully disagrees, since the above recited rejection more than adequately meets the claimed limitations. In addition, as disclosed by McCaslin in column 25, lines 18-38, when the

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signal remains for a longer duration of time (i.e., longer than 50ms) the echo suppressor will provide further attenuation of the electrical signal.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jefferey F. Harold whose telephone number is (703) 306-5836. The examiner can normally be reached on Monday-Friday 7:30am-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester W. Isen can be reached on (703) 305-4386. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.



JFH

October 18, 2002

FAN TSANG
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

